



HOMESTEAD

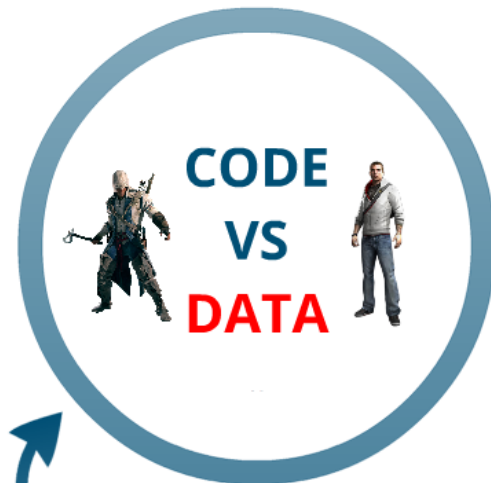
CODE, DATA AND TOOLS

Pierre-Luc Vachon
Gameplay Programmer
Ubisoft Québec

**DATA IS POWERFUL
BUT DANGEROUS**



**CREATIVE AND
FLEXIBLE TOOLS**



**GENERIC CODE
EMBRACE DATA**

CODE
VS
DATA



CODE-DRIVEN

BEHAVIORS AND INTERACTIONS

CREATED WITH CODE LOGIC

CLASSIC



OLD-SCHOOL



CODE-DRIVEN

BEHAVIORS AND INTERACTIONS
CREATED WITH CODE LOGIC

CLASSIC



OLD-SCHOOL



THE PROGRAMMER IS DOING ALL THE WORK

PROS

CONS

PROS

SHARED FOR EACH IMPLEMENTATIONS
OPTIMIZED

NO LIMIT

ERRORS ARE EASY TO IDENTIFY

LOT OF POWERFUL

TOOLS FOR DEBUG

CONS

LOT OF **COMMUNICATION**
DELAYS IN LARGE SCALE
PRODUCTION
SIMPLE FEATURES CAN BE **COSTLY**
FLEXIBILITY

DATA-DRIVEN BEHAVIORS AND INTERACTIONS CREATED WITH DATA LOGIC

MODERN



CREATOR-FRIENDLY



DATA-DRIVEN BEHAVIORS AND INTERACTIONS CREATED WITH DATA LOGIC

MODERN



CREATOR-FRIENDLY



THE DESIGNER OR INTEGRATOR IS DOING THE WORK

PROS

CONS

PROS

FAST ITERATIONS

LESS **COMMUNICATION**

EASY TO CREATE SPECIFIC CASES

ALMOST NO **DOWNTIME**

CONS

MIGHT NOT BE OPTIMAL
SPECIFIC INSTANCES
HARD TO MANAGE AND DEBUG
COMPLEXITY

CODE
VS
DATA



FUL
S



The **HOMESTEAD**





THE HOMESTEAD

Monteriggioni V2.0



BUILDING ON
ASSASSIN'S CREED
TECHNOLOGY



CHARACTERS ARE LIKE
PUPPETS

UNIQUE CHARACTERS







UNIQUE CHARACTERS

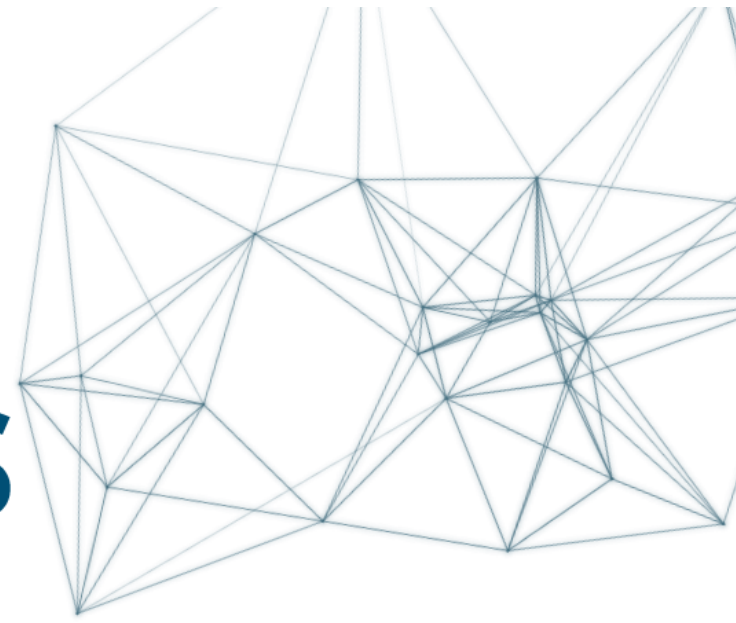


WHAT WE WANT



NPC TO **BEHAVE** AS CLOSE AS A **REAL LIFE** CHARACTER
WITH A FULL DAY OF **INTERACTIONS**
WITHOUT **TRANSITIONS** OR **GLITCHES**

FEATURES



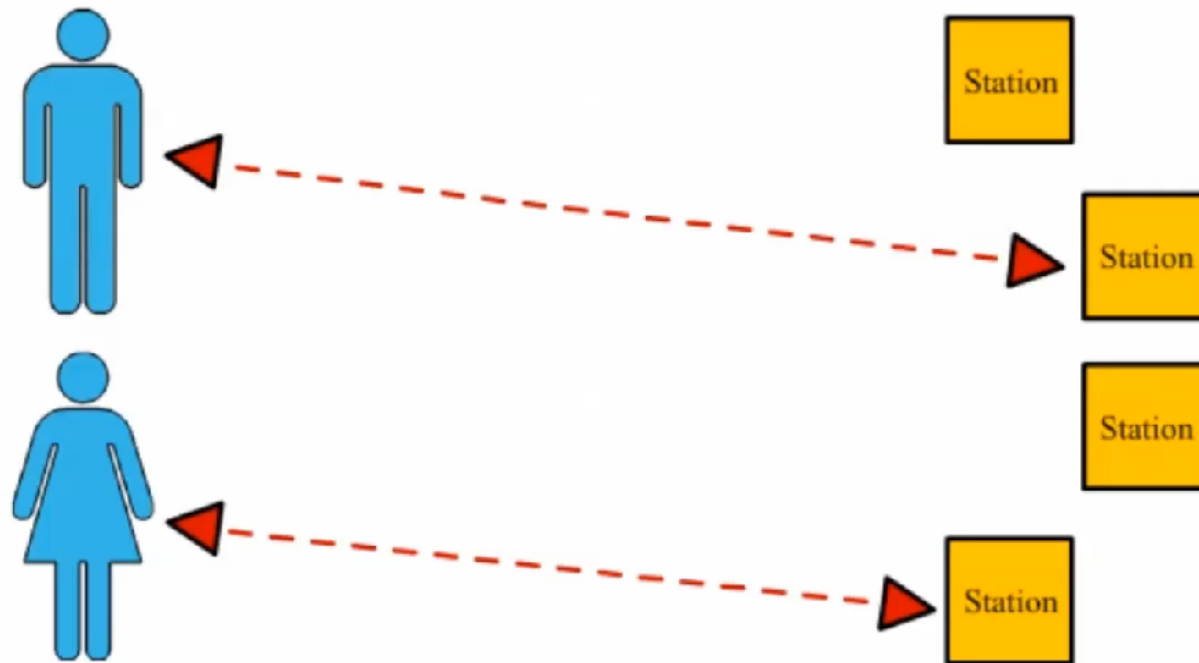
NPC IS **UNIQUE** AND INFLUENCED BY **PARAMETERS**
NON-STOP GENERIC OR SPECIFIC ACTIVITIES
NPC CAN **INTERACT**
MAXIMUM QUALITY

FIRST **PROTOTYPE**

A MANAGER IS HANDLING EACH NPC



Manager



FIRST PROTOTYPE

A MANAGER IS HANDLING EACH NPC



THIS IS MOSTLY A CODE-DRIVEN SOLUTION

FIRST PROTOTYPE

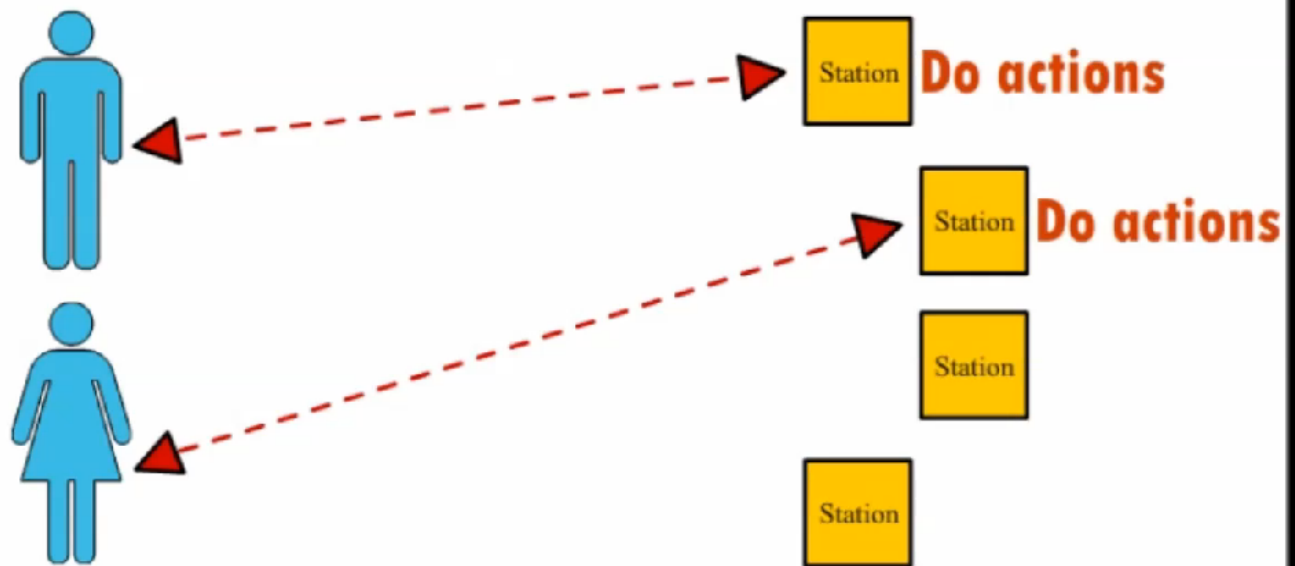


LOT OF DUPLICATION

SECOND PROTOTYPE



NO MANAGER, **ALL STATIONS ARE INDEPENDENT**





THIS IS MOSTLY A DATA-DRIVEN SOLUTION

SECOND PROTOTYPE

COLLABORATION WITH OTHER STUDIOS
GENERIC SOLUTION

COMPLEXITY

GYM



ENSURE THAT WE **CAN DO IT**
REFERENCE FOR THE TEAM

PRODUCTION



WOODWORKER
AND
HUNTRESS



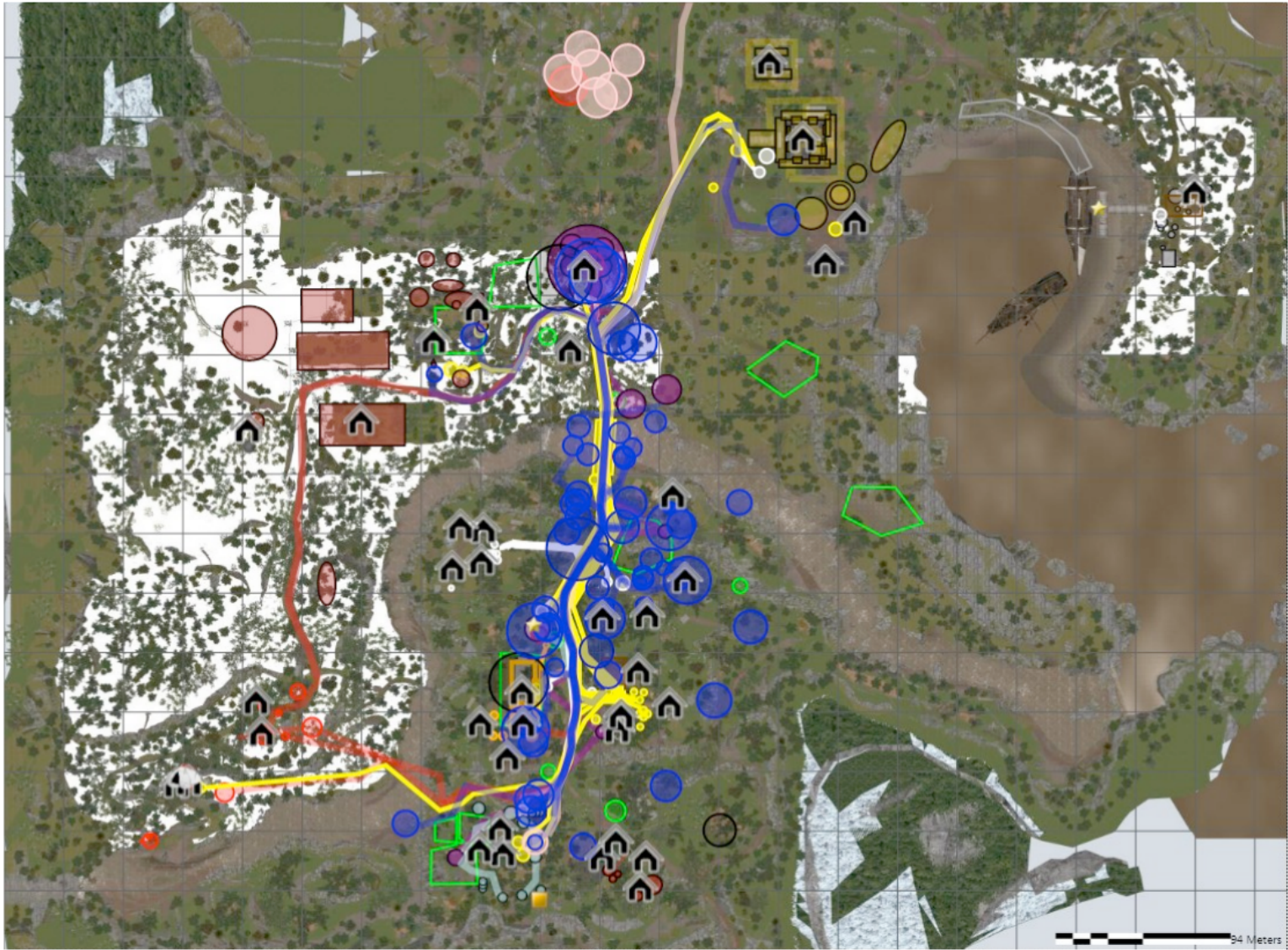
REAL
PROBLEMS
EMERGED

USING **DATA** SETUP
WE CREATED **CLUSTERS**

NAVIGATION

HOMESTEAD LAYOUT BRINGS

LONG DISTANCE







~~WE DON'T WANT THE BEST PATH~~
WE WANT THE NICEST PATH

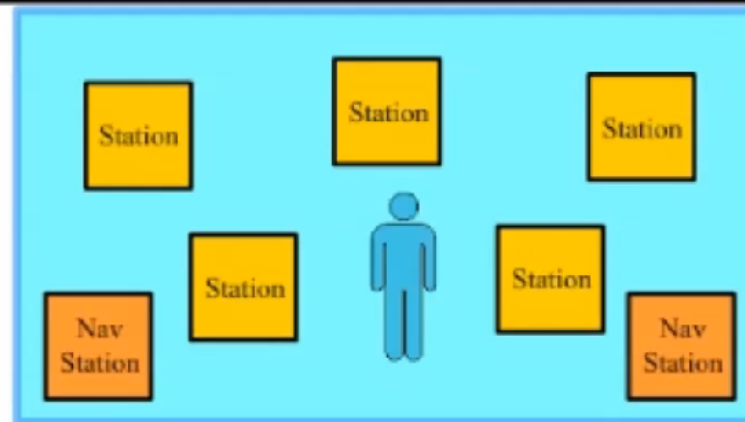


USING DATA SETUP
WE CREATED CLUSTERS

NAVIGATION

HOMESTEAD LAYOUT BRINGS

LONG DISTANCE



AND PICKING THROUGH YOUR TRASH.

WE CREATED A SMALL TRACKING CLASS

OMNI NPC

NPC CAN SPAWN

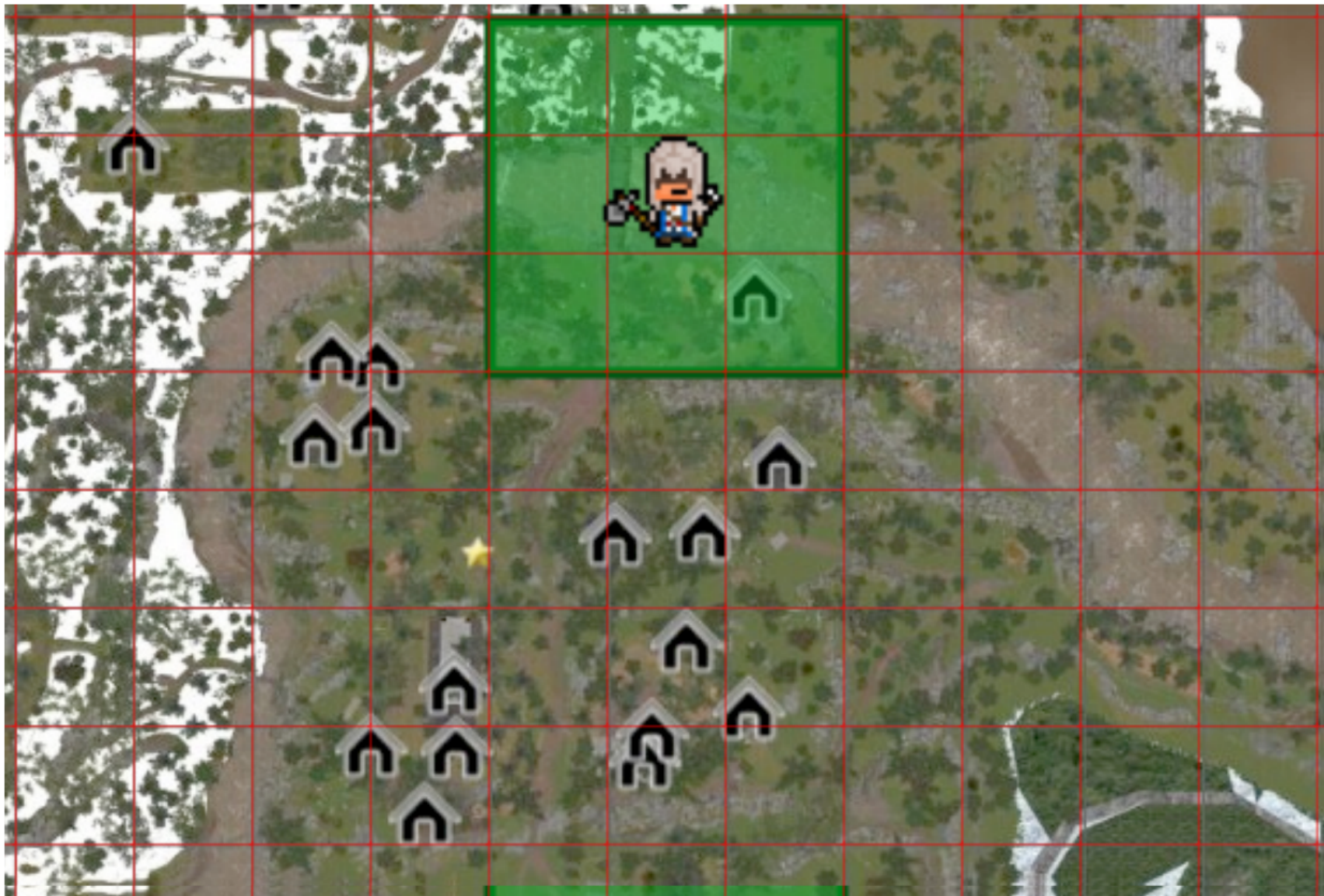
AT
MULTIPLE PLACES

WE CAN ENSURE IT TO BE UNIQUE

...BUT WHAT ABOUT
BEING CONSISTENT?







AND PICKING THROUGH YOUR TRASH.

WE CREATED A SMALL TRACKING CLASS

OMNI NPC

NPC CAN SPAWN

AT
MULTIPLE PLACES

WE CAN ENSURE IT TO BE UNIQUE

...BUT WHAT ABOUT
BEING CONSISTENT?







WE CREATED A SMALL **TRACKING** CLASS

OMNI NPC

NPC CAN SPAWN
AT
MULTIPLE PLACES



Terry was here
13:07



**WE HAVE TO MANUALLY
SET IT IN EACH STATION**



W
IN



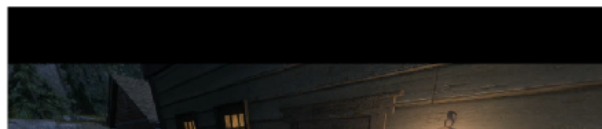
**WE REALLY WANTED
TO HAVE "REAL"
INDOOR/OUTDOOR
TRANSITIONS**



WE WANTED TO **SEE** OUR NPC
DOING THOSE **TRANSITIONS**

HOW CAN WE **ACHIEVE** THIS?

WE BRING BACK **COURTESY**

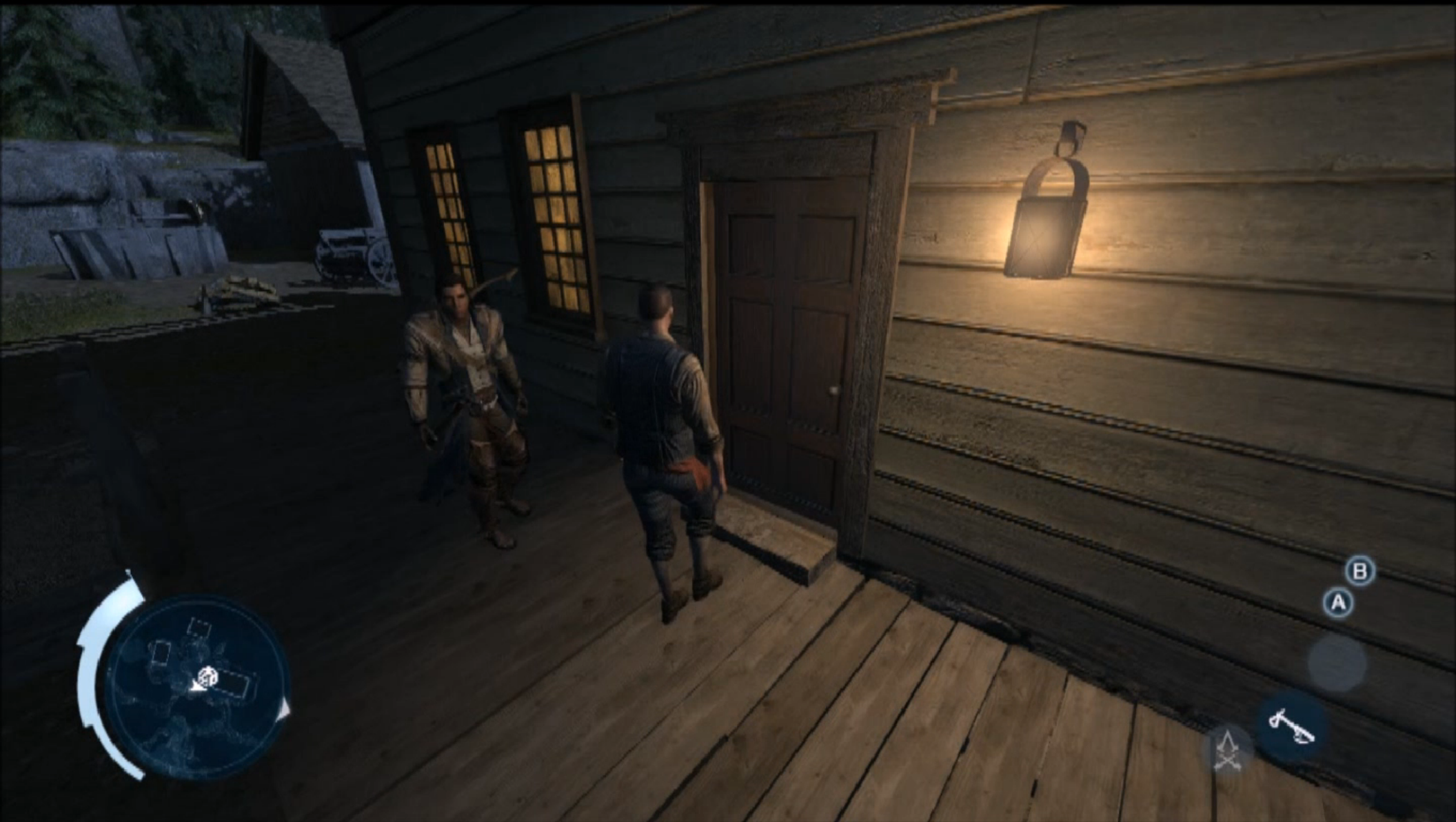


DOING THOSE TRANSITIONS

HOW CAN WE ACHIEVE THIS?

WE BRING BACK COURTESY





POST-PRODUCTION

20 UNIQUE NPC

500+ UNIQUE STATIONS

2000+ PARAMETERS

WAS IT A GOOD IDEA ?

MAYBE NOT THE
DECT

**"IT'S ONE OF THE GREAT TRAGEDY
OF LIFE — SOMETHING
ALWAYS
CHANGES."**



-Dr. Gregory House

500+ UNIQUE STATIONS

2000+ PARAMETERS

WAS IT A GOOD IDEA ?

MAYBE NOT THE
BEST

BUT SURELY NOT THE
WORST

HOW CAN WE DO BETTER ?

FUL
S



The **HOMESTEAD**



TOOLS



EDITOR





WHY NOT CREATE OUR
OWN **TOOLS** IN IT ?



WHY NOT CREATE OUR
OWN **TOOLS** IN IT ?

COST TIME AND MONEY
USED BY A **SMALL FRACTION** OF THE TEAM
MAINTENANCE
STABILITY

THE FORGOTTEN

YOU ALL **USED** IT AND **KNOW** IT



Homestead_Balancing_Aug01 [Compatibility Mode] - Microsoft Excel																
<div> <div>FileHomeInsertPage LayoutFormulasDataReviewViewAdd-InsAcrobat</div> <div> <div> <div>Cut</div> <div>Copy</div> <div>Paste</div> <div>Format Painter</div> </div> <div> <div>Clipboard</div> <div>Font</div> <div>Alignment</div> <div>Number</div> </div> <div> <div>General</div> <div>Conditional Formatting</div> <div>Format as Table</div> </div> <div> <div>Normal</div> <div>Bad</div> <div>Good</div> <div>Neutral</div> <div>Calculation</div> <div>Check Cell</div> <div>Explanatory ...</div> <div>Input</div> <div>Linked Cell</div> <div>Note</div> </div> <div> <div>Insert</div> <div>Delete</div> <div>Format</div> </div> <div> <div>AutoSum</div> <div>Fill</div> <div>Clear</div> </div> <div> <div>Sort & Find & Filter</div> <div>Select</div> </div> </div> </div>																
<div> <div>D1</div> <div> <div>D</div> <div>E</div> <div>G</div> <div>I</div> <div>K</div> <div>M</div> <div>O</div> <div>Q</div> <div>S</div> <div>U</div> <div>W</div> <div>Y</div> <div>AA</div> <div>AC</div> <div>AE</div> <div>AG</div> <div>AI</div> </div> </div>																
<div> <div>Time</div> <div>Replay</div> <div>Startup</div> <div>Condition</div> <div>Delay</div> <div>DBR :</div> <div>Distance</div> <div>y 0</div> <div>1</div> <div>Probability</div> <div>Spawn 0 Priority</div> <div>Spawn 1 Priority</div> <div>Spawn 2 Priority</div> <div>Spawn 3 Pri</div> </div>																
<div> <div>Time Sta</div> <div>End</div> <div>Unlock Lev</div> <div>Mode</div> <div>Replay Del</div> <div>Startup Condition Mod</div> <div>Delay</div> <div>DBR :</div> <div>Distance</div> <div>y 0</div> <div>1</div> <div>Probability</div> <div>Spawn 0 Priority</div> <div>Spawn 1 Priority</div> <div>Spawn 2 Priority</div> <div>Spawn 3 Pri</div> </div>																
30	GPI_DOC_LYLE_CCLS_PickingHerbs_SPW_CRD	0x37e6c7b2c	6	20	Doctor_Level1GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level1			
31	GPI_DOC_LYLE_CCLS_CheckingCrops_SPW_CRD	0x37e17744c	6	20	Doctor_Level1GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level1			
32	GPI_BLACK_DAVE_CCLS_HouseToInn_MID_CRD	0x36b33f14e	6	18	Blacksmith_LeGameplayCo	10	CheckAfterDelay	1	0	50	250	0	SpawningPriority_Level2			
33	GPI_INN_DIA_TER_CCLS_Coupleatbar_SPW_CRD	0x362d14a16	18	24	Lumberer_LevGameplayCo	150	CheckAfterDelay	10				SpawningPriority_Level2	SpawningPriority_Level2			
34	GPI_WW_LAN_CCLS_Inspectingwheelbarrow_MID_CRD	0x361cdeb843	6	18	Woodworker_GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
35	GPI_LUMB_DIA_CCLS_ExitHouse_01_SPW_CRD	0x360f6c3f6	6	18	GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
36	GPI_LUMB_GOD_CCLS_ExitHouse_SPW_CRD	0x36070dbc0	6	18	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	20	250	0	SpawningPriority_Level2			
37	GPI_LUMB_CAT_CCLS_ExitHouse_SPW_CRD	0x35fdec762	6	18	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
38	GPI_LUMB_CAT_CCLS_Goto_Bedtime_Winter_END_CRD	0x359eab5ed	0	24	Lumberer_LevGameplayCo	10						SpawningPriority_Level2				
39	GPI_LUMB_GOD_CCLS_Goto_Bedtime_Winter_END_CRD	0x356bb6aea	0	24	Lumberer_LevGameplayCo	10						SpawningPriority_Level2				
40	GPI_LUMB_DIA_CCLS_Gotosleep_Winter_01_END_CRD	0x356bb47ba	0	24	GameplayCo	10						SpawningPriority_Level2				
41	GPI_LUMB_DIA_CCLS_Gotosleep_Winter_02_END_CRD	0x356bb46ec	0	24	Lumberer_LevGameplayCo	10						SpawningPriority_Level2				
42	GPI_LUMB_GOD_CCLS_HouseToInn_MID_CRD	0x3530b1565	6	18	Lumberer_LevGameplayCo	10	CheckAfterDelay	1	0	50	250	0	SpawningPriority_Level2			
43	GPI_LUMB_DIA_CCLS_ExitHouse_02_SPW_CRD	0x351e61971	6	18	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
44	GPI_LUMB_TER_CCLS_Exit_house_02_SPW_CRD	0x351a3a812	6	18	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	20	250	0	SpawningPriority_Level2			
45	GPI_BLACK_DAVE_CCLS_Exit_house_SPW_CRD	0x3518bffa5	6	18	Blacksmith_LeGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
46	GPI_BLACK_DAVE_CCLS_Go_Home_Bedtime_WINTER_END_CRD	0x35126c931	6	24	Blacksmith_LeGameplayCo	10						SpawningPriority_Level2				
47	GPI_LUMB_TER_CCLS_ExitHouse_01_SPW_CRD	0x350898162	6	18	GameplayCo	150	CheckAfterDelay	3,5	0	20	250	0	SpawningPriority_Level2			
48	GPI_LUMB_TER_CCLS_HouseToSawmill_MID_CRD	0x34f44279e	6	18	Lumberer_LevGameplayCo	10	CheckAfterDelay	1	0	50	250	0	SpawningPriority_Level2			
49	GPI_LUMB_GOD_CCLS_SawmillTo_House_MID_CRD	0x34ec95522	0	24	Lumberer_LevGameplayCo	10	CheckAfterDelay	1	0	50	250	0	SpawningPriority_Level2			
50	GPI_TAIL_ELL_CCLS_ExitHouse_SPW_CRD	0x34e5a26f9	6	17	Tailor_Level1 GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level3			
51	GPI_INN_OLI_CCLS_Exit_house_SPW_CRD	0x34e324dcf	6	12	Innkeeper_LeGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level3			
52	GPI_WW_LAN_CCLS_Exit_house_SPW_CRD	0x34e035db5	6	18	Woodworker_GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
53	GPI_LUMB_TER_CCLS_SawmillTo_House_MID_CRD	0x34e01494d	0	24	Lumberer_LevGameplayCo	10	CheckAfterDelay	1	0	50	250	0	SpawningPriority_Level2			
54	GPI_LUMB_GOD_TER_CCLS_Enteringsawmill_SPW_CRD	0x338c0a5a9	6	19	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	80	250	0	SpawningPriority_Level2	SpawningPriority_Level2		
55	GPI_WW_LAN_CCLS_ShovelingSnow_MID_CRD	0x3441f85bd	6	18	Woodworker_GameplayCo	100	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level1			
56	GPI_LUMB_TER_CCLS_Fishing_Seated_MID_CRD	0x3384c5478	6	18	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
57	GPI_LUMB_TER_CCLS_CheckingCrops_02_MID_CRD	0x336be668d	6	20	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
58	GPI_LUMB_TER_CCLS_CheckingCrops_01_MID_CRD	0x336be5ecd	6	20	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
59	GPI_TAIL_ELL_CCLS_Smoking_Winter_SPW_CRD	0x337ea7dd9	6	20	Tailor_Level1 GameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			
60	GPI_BLACK_DAVE_CCLS_ForgingMetal_MID_CRD	0x333483107	6	20	Blacksmith_LeGameplayCo	300	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level1			
61	GPI_BLACK_DAVE_CCLS_Sharpentingool_MID_CRD	0x33237e2e2	6	20	Blacksmith_LeGameplayCo	300	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level1			
62	GPI_LUMB_CAT_CCLS_Walking_SPW_CRD	0x320610e01	6	20	Lumberer_LevGameplayCo	150	CheckAfterDelay	3,5	0	50	250	0	SpawningPriority_Level2			

MASSIVE DATA MANIPULATION

DATA
TEMPLATE



CREATE **DATA**
MANIPULATION
IN **CODE**



MASSIVE DATA MANIPULATION

DATA
TEMPLATE



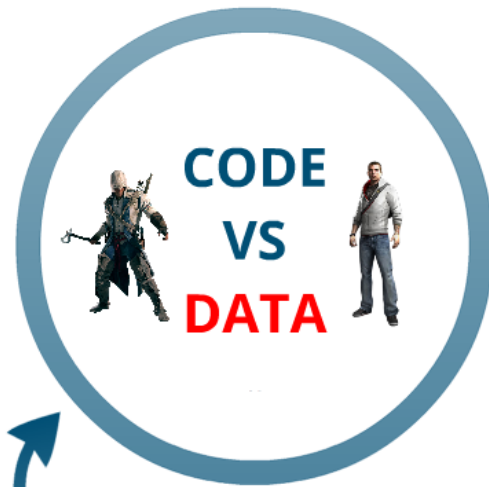
CREATE **DATA**
MANIPULATION
IN **CODE**

SCRIPTING YOUR EDITOR
CREATE **SPECIFIC** TOOLS

**DATA IS POWERFUL
BUT DANGEROUS**



**CREATIVE AND
FLEXIBLE TOOLS**



**GENERIC CODE
EMBRACE DATA**

CREDITS

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QUESTIONS

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THE END

Come and see us at the **UBISOFT** booth
if you have questions or want to buy me
a beer. Yes I am easy like that.